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U.S. UPLAND COTTON'S COMPETITION IN FOREIGN MARKETS



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FOREWORD

Beginning in 1968-69, the Cotton Division of FAS intensified its work on competition for U.S. cotton from foreign Free World producing countries. It was decided to concentrate on the 12 countries whose cotton competes most directly with U.S. cotton sales in world markets. These were Mexico, El Salvador, Nicaragua, Guatemala, Brazil, Tanzania, Uganda, Greece, Turkey, Iran, Pakistan, and Syria. Many other relatively important cotton producing countries (i.e., Argentina, Peru, Spain, Mainland China, India, Sudan, the United Arab Republic) were not included because they either produce qualities of cotton not directly competitive with U.S. exports or export only a small portion of their production.

The original plan called for annual studies of Mexico, owing to the importance of that country as a competitor for U.S. cotton, and for studies of the other 11 countries in alternate years. With the exception of Syria, this program was carried out in 1968-69 and 1969-70. Because of the political situation in the Middle East, it was not possible to visit Syria, and information concerning that country was obtained only from secondary sources.

In 1970-71, the work program was further intensified. Studies were updated on all of the countries included in the program except for Tanzania, where the production cycle made it impracticable to repeat the visit of the preceding year. In addition, new studies were made of cotton production and prospects in Nigeria, Chad, and Colombia, and on the upland cotton production of the Sudan.

In 1970-71, individual competition studies were conducted on the following countries: Mexico, Greece, Turkey, Pakistan, Iran, El Salvador, Nicaragua, Guatemala, Pakistan, Iran, Nigeria, Chad, Sudan, Uganda, Brazil, and Colombia. These studies drew upon earlier Division studies of cotton competition and of interfiber competition. The present report also draws upon analyses of the competition in European importing markets now being prepared.

Detailed studies on the individual countries which were included in the 1970-71 program have been published or will be released in the next several months. Interested persons may obtain copies by writing to the Information Service Branch, Foreign Market Information Division, Foreign Agricultural Service, U.S. Department of Agriculture, Room 5918, South Building, Washington, D.C. 20250.

The present report, which summarizes on a broad basis the conclusions of the individual country studies, is intended to provide policy makers and other interested persons in Government and the U.S. cotton industry with a better understanding of foreign competition likely to be faced by U.S. cotton in the immediate future. Major emphasis is placed on competition from foreign growths of cotton, with appropriate discussion of competitive aspects within import markets and from manmade fibers. Where appropriate, statistical regression analysis was used to identify past trends and possible relationships between competitive factors.

Plans call for a continuation of the cotton competition work in 1971-72 and subsequent years. In addition to the foreign Free World producing countries already studied, the Cotton Division hopes to undertake a study of competition from the USSR, if it is possible to conduct the necessary field work during the coming year.

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U.S. Upland Cotton's Competition in Foreign Markets

SUMMARY AND CONCLUSIONS

The U.S. cotton industry faces an increasingly difficult task in maintaining and increasing sales of cotton in foreign markets. This study focuses on major problems confronting U.S. upland cotton exports and suggests possible avenues of action to combat such problems. Special attention is given to prospects in major competing countries during the 1971-72 season.

Recent field studies in major exporting countries, confirmed by regression analysis of acreage response to price changes, suggest that the stage is set for a substantial rise in foreign upland cotton acreage and production in 1971-72. These studies indicate an aggregate increase of 1.6 million acres next season in the 13 countries that supply over three-fourths of the upland cotton exported in competition with U.S. cotton¹. Normal growing conditions and yields in those countries would result in increased production of about 1.4 million bales². Probably about 1 million bales of the increase will be available for export after domestic requirements are filled. Other foreign Free World countries may increase production of upland cotton about 600,000 bales, mostly in India for domestic use.

Production in the USSR may fall more than 1 million bales below this season's extremely large crop assuming a return to more normal growing conditions, but exports could increase because of the large carryover into the new season.

A rough estimate is that total foreign exports of upland cotton could rise considerably more than 1 million bales in 1971-72 above 1970-71. However, most or all of this increase could be absorbed without reducing U.S. shipments below this season's expected level of at least 3.5 million bales, provided that: (1) foreign Free World consumption continues a modest expansion; (2) foreign importers moderately increase low raw cotton stocks, and (3) an adequate supply of attractively priced U.S. cotton of desired qualities is available.

In recent years, c.i.f. Liverpool quotations for foreign growths of Strict Middling 1-1/16-inch cotton usually have held between 27 and 30 cents per pound. At these levels, producers in foreign countries have become increasingly sensitive to price changes. Almost without exception, changes in world prices one year have been followed the subsequent year by changes in the same direction in cotton acreage. Changes are most pronounced in countries that export a large part of production. It appears that under present conditions a world price of 30 cents per pound for SM 1-1/16 inches is likely to trigger a substantial rise in foreign acreage, while prices below 28 cents dampen foreign producer enthusiasm.

By the end of February 1971, prices for most growths of upland were 3-4 cents per pound higher than the recent low point reached in the latter part of 1969, and well above the 30-cent level in Liverpool. U.S. cotton prices were competitive with those for most major competing growths during the first half of the 1970-71 season. However, U.S. cotton has now lost the competitive edge, following a sharp rise in prices as a result of depleted supplies and a discouraging outlook for larger acreage in 1971-72.

While consumption of cotton outside of the United States has managed to increase slowly for several years despite rapidly rising use of manmade fibers, exports of U.S. cotton have slipped substantially. The United States now supplies only one-fifth of the upland cotton sold in foreign markets, compared with over one-half in the mid-1950's. Other cotton exporting countries have expanded exports within their ability to increase production and fulfill larger domestic requirements of raw cotton. Major factors enabling competing countries to expand production include generally favorable costs and returns on cotton compared with alternative crops, relatively low costs between farm and market, attractive government subsidies and beneficial policies in many countries. Also, cotton was one of the few crops for which production could be expanded greatly without a sharp decline in local prices.

¹Mexico, Guatemala, El Salvador, Nicaragua, Colombia, Brazil, Iran, Pakistan, Turkey, Syria, Greece, Uganda, and Tanzania.

²480 lb. net weight.

Production costs vary widely among major upland cotton producing countries that compete strongly with U.S. cotton in world markets. Rough estimates indicate that at national average yield levels, costs in Mexico are similar to U.S. costs, while Greek costs are higher, and Turkish, Colombian, and Central American are somewhat lower. Costs in Iran and Pakistan are considerably lower than in the United States. South Brazil probably has the lowest costs of any major cotton exporting country studied, except East Africa, where nearly all costs are in the form of unpaid family labor.

Production costs in the United States and foreign countries vary sharply from one area to another and as yields differ from the national or regional area. In all countries, a substantial part of the crop is produced at costs far below the national average. A sizable portion of the U.S. crop is produced at costs competitive with foreign countries. However, several factors favor foreign producers. Producers in some, but not all, countries have access to enough land for an economic unit by local standards, while U.S. farmers generally have operated under strict acreage limitations for many years. Some countries have a captive home market for oilseeds, so that cottonseed prices may be far above the U.S. level. Also, farmers in some countries receive subsidies on input items.

While making every effort to reduce production costs so as to enable its cotton to compete more effectively with manmade fibers and other growths of cotton, the U.S. cotton industry must explore every avenue to reduce costs between the farm and mill. In most competing countries, ginning charges per bale are \$5 or more below the average U.S. level. Additional savings come from elimination of recompression and by using relatively simple marketing channels—nearness of cotton producing areas to ports and less costly ocean transportation benefit cotton in many countries.

Generally, improved efficiency of production methods is quickly transferred from the United States to competing countries. However, an improved marketing system could be a lasting benefit, because it could put U.S. cotton on a more competitive basis with that of other nations that already provide the services at lower costs. Changes necessary to reduce off-farm expenses would be difficult to make in an industry with ingrained methods of operation. Nevertheless, the alternative—now being followed—may be for U.S. cotton to continue to lose foreign markets and for the industry to continue to demand large injections of federal assistance.

Off-farm practices followed in many foreign countries contribute significantly to lower export prices and a more acceptable product. Gins frequently handle 10,000 bales or more per gin over a several-month period (U.S. gins average about 2,500 bales in a typical 6-week period); less expensive, lightweight tare is used; bales are pressed to final export density at the gin; repeated sampling is avoided—in some countries only 5 or 10 percent of each lot is sampled; fewer changes in ownership occur between grower and user; and cotton is identified by variety and area of growth, and in some countries by official grade and other information.

Much cotton is sold before ginning on the basis of seed cotton grades of specific varieties. In a few countries, output from larger farms is held in storage until a sizable quantity is accumulated for ginning. The system of seed cotton marketing facilitates low-cost gin operations and the assembly of large blocks of relatively uniform cotton. To some extent, a seed cotton marketing system de-emphasizes placement of each bale into a narrow, painstakingly defined category as is done in the United States; but foreign buyers find no resulting problem from the practice, because in most countries varieties are known and are not mixed in marketing.

While the world textile market continues to expand at a rapid pace, cotton consumption barely manages to creep upward. In 1968, for the first time, world use of manmade fibers exceeded use of cotton. All cotton producers live with the threat from manmade fibers, and several countries have banded together to form the International Institute for Cotton and fight for markets in the textile industry.

The two major classes of fibers within the manmade group must be fought somewhat differently. For the most part, cellulosics are considered in uses where cost is the primary concern. In recent years, cellulosic expansion has virtually stopped when prices of SM 1-1/16-inch cotton have been well below 30 cents per pound in import markets. Since higher cotton prices revive the upward trend in usage of cellulosics, it seems obvious that relatively low priced cotton is essential to effective competition with cellulosics.

Competition between cotton and noncellulosic fibers is more complex. Continued research is needed on cotton to improve the strength and abrasion resistance needed in today's easy care finishes and to find the optimum proportion in blends of cotton and noncellulosic fibers in various end-uses. More technical assistance could help processors use cotton more effectively, and promotion is needed to enhance cotton's image in the minds of processors and customers. In addition, every effort must be made to pursue a moderate price policy for cotton so as to encourage use of the fiber to the greatest extent possible.

COMPETITION FROM FOREIGN COTTON

Basic to the struggle for sales in upland cotton import markets is the tendency for an increasing number of nations to push with all available resources for maximum production of cotton. Currently, 30 countries each produce 100,000 bales or more of cotton annually; two decades earlier, only 18 nations produced cotton in such quantity. While a major part of the cotton moving in world trade originates in relatively few countries, the 50 or more countries that individually produce relatively small quantities add substantially to the aggregate export level. Furthermore, many countries now produce much or all of the cotton needed for domestic use. In a growing number of countries, some of the larger domestic production of raw cotton is exported in the form of textiles.

Foreign countries in developing their national agricultural plans weigh the advantages and disadvantages of expanding various crops. Cotton, coffee, sugar, sisal, and corn as examples of crops which are traded internationally in volume and thus can generate foreign exchange earnings. All utilize considerable quantities of relatively unskilled labor. All provide opportunities for some domestic processing industries, thereby contributing to the industrialization of the country. On these points, their differences are not great. Contrasts are greater, however, when their price patterns are examined. Cotton has been subject through time to fewer wide swings in world prices. Invariably, Government officials have been impressed by the orderly pattern of international cotton prices—especially within a season—but also by the moderate degree of change from one year to the next.

Greater international cotton price stability relative to other farm products has been a major factor in leading many countries to place emphasis on greatly expanding cotton production and exportation. When one seeks the reason for this price stability, the trail leads directly to the influence exerted on world prices by the production control and price support programs carried out in the United States.

Throughout much of the past two decades, cotton prices were conducive to encouragement of maximum production with little regard to efficiency of operations. Technological improvements increased yields sharply. Especially noteworthy were widespread adoption of higher yielding varieties and increased use of irrigation, fertilizer, insecticides, and other advanced production practices. In 1950, foreign upland cotton area totaled about 53 million acres; a decade later, area totaled nearly 60 million. In most recent years, higher yields on relatively stable acreage of about 66 million have pushed foreign production to ever higher levels. Production in 1950 totaled about 21 million bales, and a decade later 30 million were grown, while the 1970-71 crop is now expected to approach 39 million.

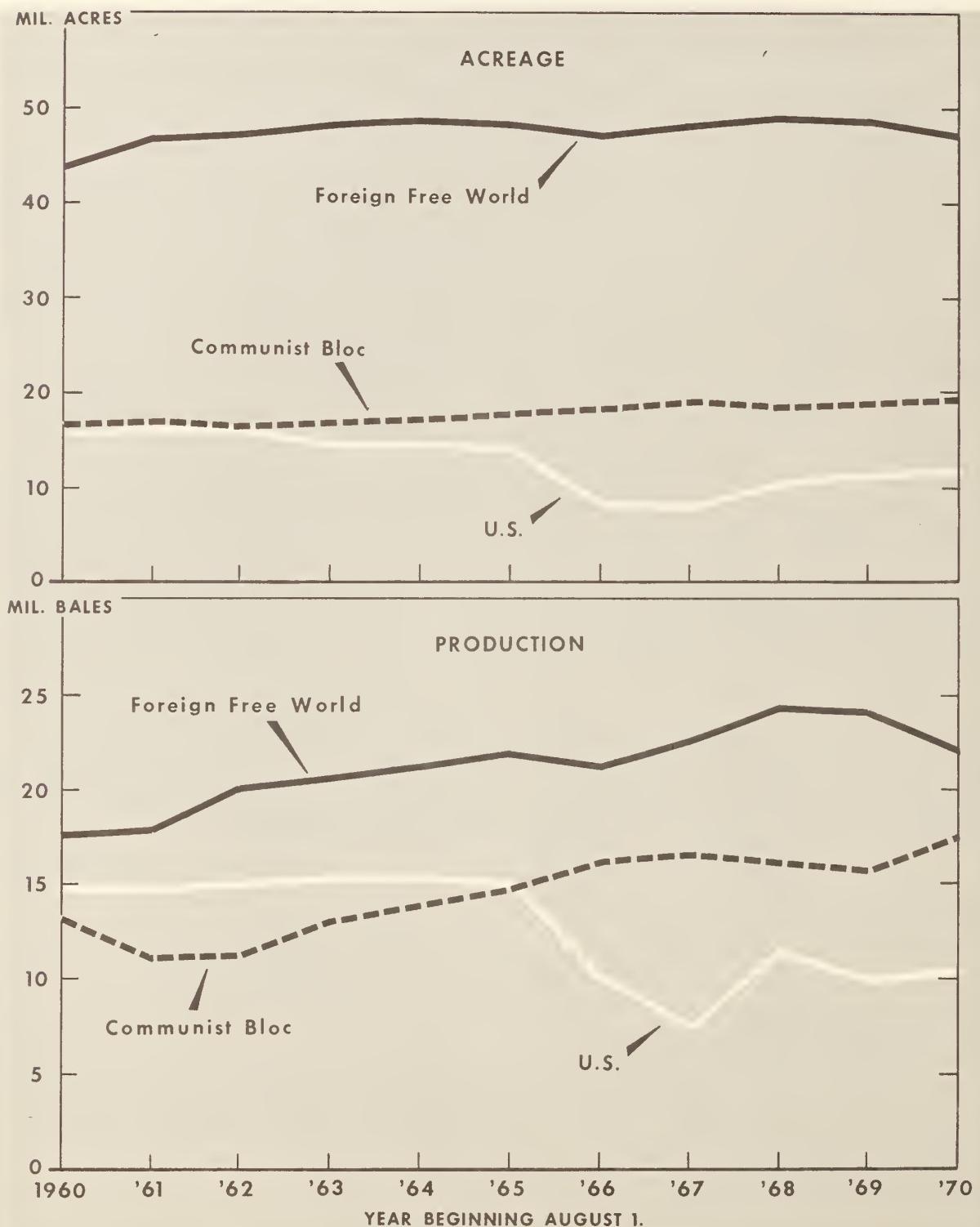
Much of the increased cotton production and trade during the past decade occurred in the 13 countries discussed in this study. These countries increased production 5.4 million bales or 69 percent during the 1960's. However, increases in relatively small producing countries, added together, contribute a sizable quantity to world production. For example, the 9 countries shown in the table on page 11 increased total production 1.2 million bales or 332 percent during the 1960's. This quantity—larger than this season's exports from either Mexico or Central America—was used to expand exports from the producing nations or to reduce imports.

Prospects for 1971-72 cotton production.—During studies of the cotton situations in competitive countries, Cotton Division staff members gave particular attention to developing estimates of cotton acreage and production in the 1971-72 season.

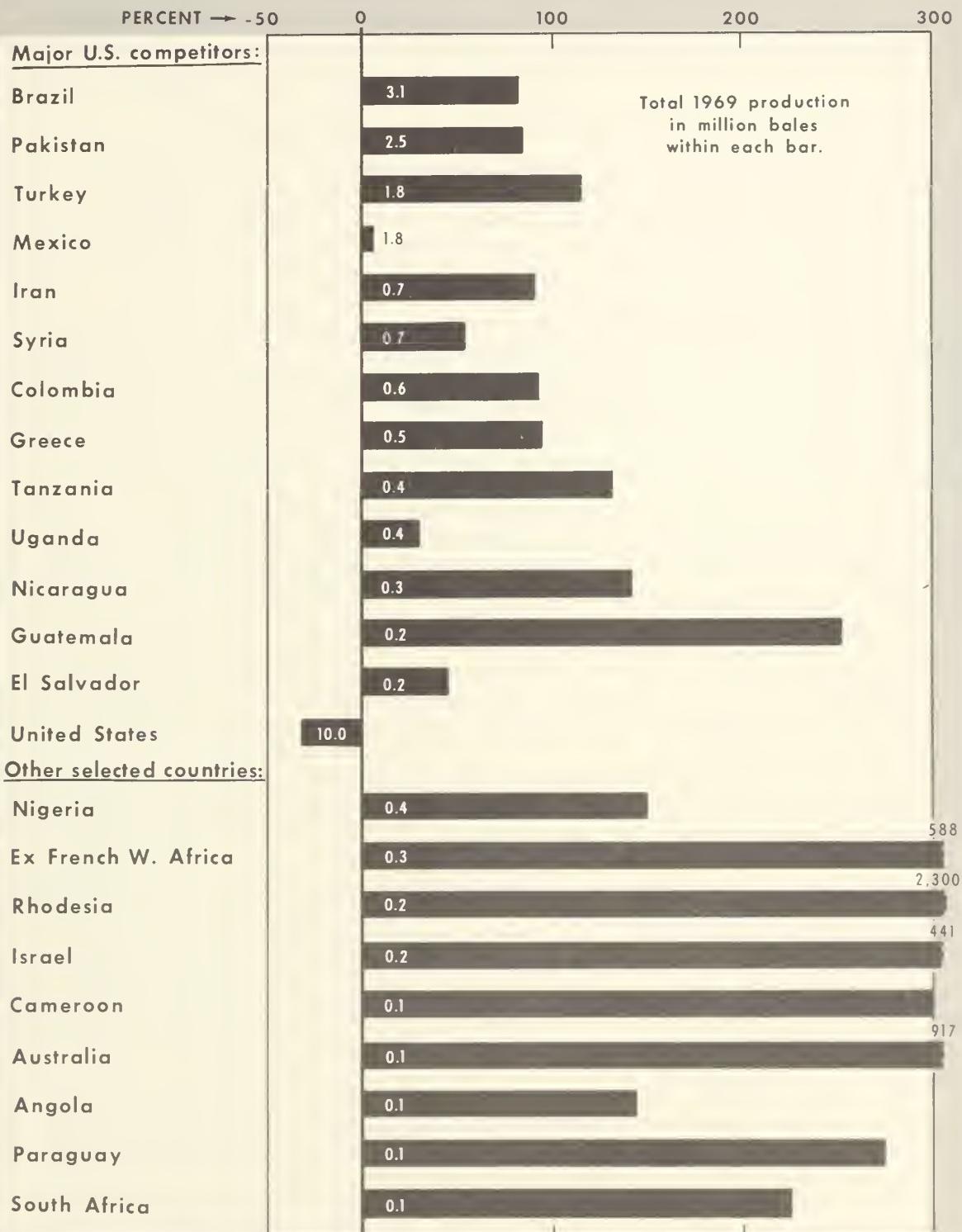
Prospects for the crop were discussed with knowledgeable persons in each country studied, and consideration was given to such factors as the world cotton supply and demand situation, government policies, producer response to price changes, production costs, profits from cotton and alternative crops, and related factors. Available secondary data were considered also.

Individual country-by-country estimates point to aggregate acreage in these countries of 19.9 million acres in 1971-72, compared with 18.3 million in 1970-71, and the record high of 20.3 million in 1968-69. The recent rise in world cotton prices is a key element in the expected increase in acreage. Normal yields on the expanded area would result in 1971-72 production of about 13.6 million bales, up from 12.1 million in 1970-71, but still below the record 1968-69 level of 14.1 million.

UPLAND COTTON: ACREAGE AND PRODUCTION OF SPECIFIED AREAS



**PERCENT CHANGES IN U.S. AND FOREIGN COTTON
PRODUCTION, 1959-69**



Over one-third of next season's world production increase is expected to occur in Brazil, because of a return to larger acreage in the South and the assumption of more normal growing conditions in the Northeast. In Mexico, this season's favorable yields and prices could encourage a modest acreage expansion, but competition from alternative crops remains strong. In Central America, rising prices have prompted plans for increased cotton plantings. In Pakistan, prices have reacted upward sharply in the wake of strong demand from both domestic and export markets, and cotton acreage may expand considerably. In Iran, acreage may recover part way from the reduced 1970-71 level. In Greece, high production costs and continued strong competition from alternative crops probably will prevent cotton expansion. In Turkey, some disappointment with profits from wheat and improved profit potential from cotton seems likely to encourage increased cotton acreage in 1971-72.

Cotton prices.—A number of factors influence cotton prices, which in turn play a major role in determining production in many of the major exporting countries. As expected, foreign Free World cotton consumption and production exert a strong influence on prices. Production and use of manmade fibers are closely associated with cotton prices, with noncellulosics now playing the more dominant role. Stocks of cotton on hand at the beginning of each season have a strong influence on prices. Little statistical importance is attached, however, to whether these stocks are in the United States, the foreign Free World, or the Communist Bloc.

For many years, there has been a tendency for beginning world stocks to center around 6 months' consumption requirements. Rarely has world carryover dropped below 5 months' supply or exceeded 7 months', and there is a strong tendency for prices to react in the opposite direction whenever stocks approach these limits. It would appear that a world carryover equal to at least 6 months' requirements best meets the need to provide the quality distribution required and to discourage further inroads of manmade fibers into cotton end-uses. The 19.5-million-bale estimate of stocks on August 1, 1971, is less than 4.5 months' estimated world consumption for 1971-72.

Following a 2-year decline, prices for longer stapled upland cotton turned upward near the end of calendar 1969 in foreign import markets. Production prospects then indicated somewhat smaller production in the United States and many foreign producing countries. Stocks in most countries were at relatively low levels. Despite higher prices during the second half of the 1969-70 season, the average price for the full crop year dropped below the level of a year earlier. The lower average price in 1969-70 was followed by reduced cotton production in 1970-71. Unfavorable weather contributed to reduced yields and income from cotton in some countries.

As evidence of smaller crops in 1970-71 in country after country became clear, cotton prices moved upward sharply. By the end of January 1971, offering prices for most growths of cotton in foreign import markets were 3 to 4 cents per pound above the level 16 months earlier. Largest increases were for shorter stapled and/or lower grade cotton.

Trends in production and prices of shorter stapled upland cotton differ somewhat from trends for longer staples. World prices of shorter staples have moved higher in recent years as burdensome supplies in the middle 1960's were replaced by a relatively tight supply situation. In recent months, import offering prices for this type of cotton have risen considerably more than prices of longer stapled cotton.

Cotton prices now have reached a level clearly conducive to increased production in foreign exporting countries. Current high prices, prompted in part by low world stocks of less than 4.5 months' supply, support the probability of substantially larger foreign acreage next season of all lengths of upland cotton.

U.S. cotton was generally competitive in world markets during the current season until about the middle of January and sales for export were heavy. In February and March 1971, however, U.S. prices rose by 1 to 2 cents per pound, while those of most foreign growths receded slightly after a sharp increase earlier. At the end of March, U.S. cotton prices were not competitive with those in Russia, Turkey, Brazil, and Greece, the principal export competitors at that point in the season.

The market conditions that led to this reversal of U.S.-foreign price ratios—and are still in the picture—are (1) downward revisions in the U.S. 1970 crop estimates since August, a poor outlook for increased U.S. cotton acreage in 1971 and depleted supplies after several months of heavy sales, all of which have encouraged a substantial price rise; (2) the arrival of cotton from the record high 1970 Russian crop on the market in quantity in January with a price decline of 2 to 2-1/2 cents from the late November level of 34 cents c.i.f. Liverpool for USSR SM 1-1/16 inches; and (3) continued weak demand and prices for cotton yarn and textiles in most cotton import markets.

As the U.S. share of world cotton trade has declined over the years, the influence of U.S. price changes has lessened in import markets, especially during periods when U.S. supplies have been relatively tight. U.S. cotton has usually provided an effective floor under prices that prevented major drops in the price of cotton, and foreign cottons were able to sustain a price most of the time that enabled their cotton to move into export in whatever volume they had available. Regression analysis suggests that during the past seven seasons, a 1-cent change in the price of United States SM 1-1/16-inch cotton in Liverpool was associated with an average change in the same direction of 0.65 cent in similar competing growths. The relationship is statistically significant at the 1 percent probability level.

Production response to price changes.—During the late 1950's and early 1960's prices trended downward but were generally well above production costs on most farms in most countries. Therefore, cotton acreage showed little response to price changes. In recent years, at the lower level prevailing, price changes were positively associated with acreage changes. As might be expected, price changes in one year are reflected in large measure in acreage changes in the following season. Rising costs for some inputs also contributed to reduced profits on farms where increased efficiency was not effected.

When crop-year average prices and cotton acreage for the period 1963-70 in the 13 countries covered in this report were measured statistically,¹ the relationship between price in one season and acreage in the following season was significant at the 1-percent probability level. As expected, price is far more important in influencing acreage in key competing countries than in the aggregate foreign Free World. During the past 7 years, a 1-cent change in the foreign Free World price of SM 1-1/16-inch cotton was associated with an average change in the same direction of 491,000 acres. Price explained 81 percent of the change in acreage. The projection of 1971 acreage was almost identical with estimates made independently by staff members for individual countries based on recent field trips to the countries. Indications that foreign countries will increase production in 1971 point up clearly the influence of the sharp rise in world cotton prices in 1970 and early 1971.

A workable statistical model similar to that for acreage was developed for projecting aggregate production in our key competing countries. The production model has an r^2 of 0.63 and is statistically significant at the 5-percent probability level. A 1-cent change in price is associated with a change in the same direction of 601,000 bales of cotton. The statistical projection of 13.6 million bales in 1971 is about the same as was estimated subjectively by the Cotton Division staff.

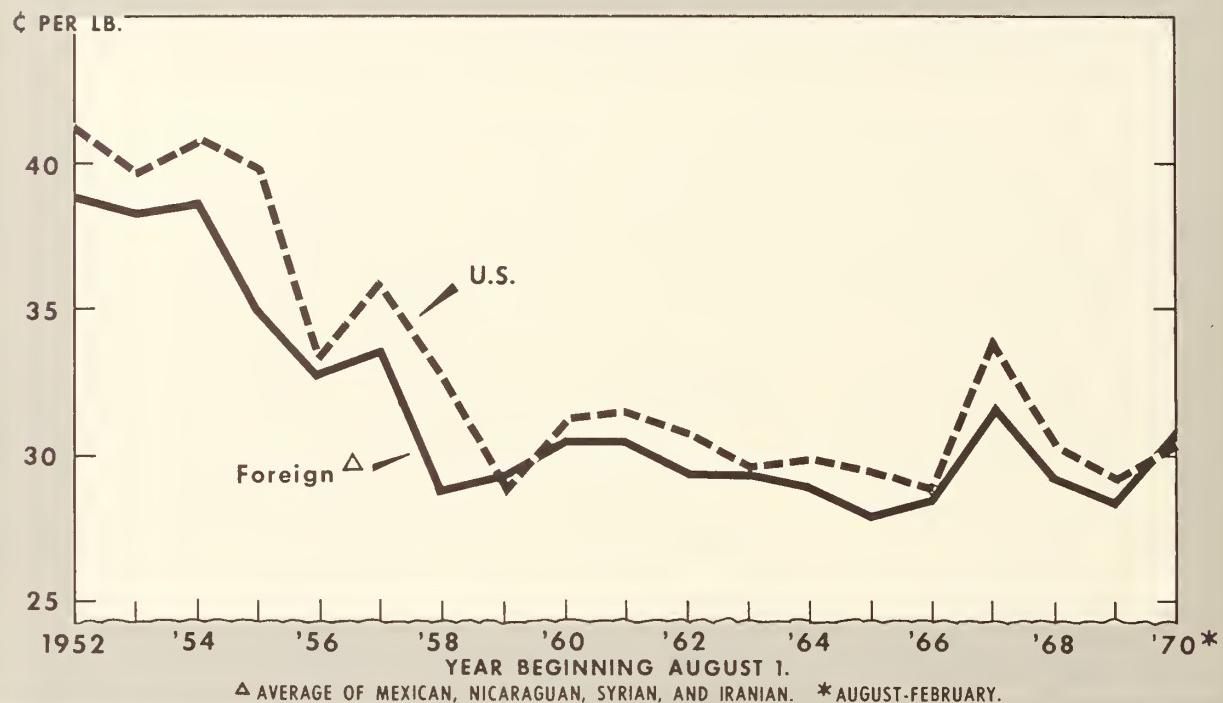
The regression models used in the report appear to be most reliable when used on data within the range covered in formulation of the models. Liverpool prices above 30 cents for SM 1-1/16 inches cotton are clearly conducive to further expansion. Prices below 28 cents are clearly restrictive within the present production-cost structure in many countries. However, many producers can put into operation efficiencies that could enhance profits at lower price levels. Note that prices have been discussed in terms of quotations in import markets. This procedure is acceptable as long as probable effects are discussed in terms of price changes, and the practice eliminates the cumbersome problem of handling farm prices in different nations with different quality concepts, marketing practices, and monetary units.

Producer response to changes in price can vary sharply from country to country and from one farm to another within each country. Although there are striking exceptions, response is related strongly to the share of the nation's crop that is exported. For example, in Central America, where most cotton is exported, producers respond to price changes more readily than in Turkey, where domestic consumption absorbs a sizable part of the crop and where government policy to some extent has isolated farm prices from world prices. Some other key factors influencing price responsiveness are: (1) The extent to which producer prices are isolated from world prices; (2) the extent to which production inputs require cash or credit; (3) the level of production costs; (4) alternative land usage; (5) type of agricultural system, i.e., subsistence vs. commercial, and (6) government policies. Of course, there are many other factors that influence price responsiveness on individual farms.

In Uganda and Tanzania (and in some areas in other nations—such as parts of Northeast Brazil), the influence of price on acreage or production does not appear to be statistically significant. Their farming systems are geared toward self-sufficiency. Small quantities of cotton per farm are produced with almost no cash inputs in order to finance the purchase of the families' minimal off-farm needs. Producers receive fixed cotton prices buffered to a great extent from world fluctuations.

¹Regression formula $y = a + bX$. Prices were crop-year averages of Mexican, Nicaraguan, Syrian, and Iranian, SM 1-1/16 inches, c..... Liverpool.

**LONG-TERM TREND OF C.I.F. OFFERING PRICES FOR
SM 1¹/₁₆-INCH COTTON IN LIVERPOOL**



Exports of cotton from the USSR have become increasingly important in Free World import markets in recent years, and sizable shipments now go to many markets where U.S. cotton is sold. Also, the USSR purchases considerable quantities of upland cotton from a number of our Free World competitors. Changes in USSR purchases and sales sometimes are an important influence on cotton supplies and prices in specific markets. However, limited available information about operations of the USSR cotton industry within the economic system makes a useful appraisal of future plans difficult. World cotton prices seem to have little effect on USSR production or exports of cotton, although supplies within the country probably have a modest influence on imports and exports.

After several years of stable acreage around the 6-million level, expanded irrigation facilities prompted the USSR to increase cotton area to 6.5 million acres in 1970. Production in most recent years has exceeded 9 million bales. However, weather conditions were excellent in 1970-71, and the crop is now estimated at 10.8 million bales—1.5 million bales above the previous high. The USSR ginning system operates almost the year around, so this season's large crop will become available over a period of 12 to 15 months. The larger supply probably will be used to build up relatively low stocks at the beginning of this season, decrease imports, and provide for increased consumption. Also, exports may increase considerably from the 2 million bales shipped in 1969-70, with heavy export shipments continuing into the 1971-72 season. A sizable reduction in the 1971-72 USSR crop is likely if weather conditions are normal. Normal yields of about 730 pounds of lint per acre on a slight increase in acreage would suggest a crop of about 10 million bales.

Production costs in selected countries.—The cost of producing cotton is an important factor to be considered in deciding whether to grow cotton or some other crop. However, it must be remembered that cost data represent but one part of the equation and are of limited value without data on returns and related information for cotton and competitive crops. Cotton Division staff members have obtained considerable data on general costs of producing cotton during field studies in various countries. Cost estimates presented here were developed from discussions with farmers and other knowledgeable cotton leaders and from other sources such as farm and financial organizations and government records. The information is useful in suggesting general levels of production costs in the various countries.

Actual costs often vary greatly from one area to another in each country and from one farm to another in each area. Yield changes account for most of the difference in cost per unit of output from one season to the next in a given area, while changes in price received generally account for most of the variation in profit (or loss) on specified yield from one season to another. The lower yield figure for each country shown in the accompanying table is a level fairly near recent national averages, while the higher figure is a yield that is generally attained by many of the better farmers.

A study of production costs for the 1970 crop in four of the major cotton producing areas of the United States concluded that total costs were 32.7 cents per pound on an average yield of 459 pounds of lint. Direct costs averaged 25.5 cents per pound. As expected, U.S. costs varied sharply from one region to another. Yield appeared to be the prime reason for differences in unit of production costs within regions. Despite the high average cost of producing U.S. cotton, a sizable part of the crop is grown at much lower costs. For example, over one-third of the 1966 crop (the last year for which detailed information is available) was produced for less than 21 cents per pound. Several regions in Texas produced one-fourth to one-half of their cotton at a total cost of less than 15 cents per pound. In these regions, cash inputs are relatively low. Although regional yields are low, the higher yielding farms had the lowest costs. In other regions where higher yields offset higher cash costs, a considerable part of the crop is produced at a cost well below the national average. Cotton is generally the most profitable crop to which large acreage can be planted in major cotton regions, especially when yields are above average for the region.

Direct costs—or returns over and above direct costs—generally are a better indicator than total costs of cotton's ability to compete with other farm enterprises over a short period of time. While cotton or other crops may be produced under adverse growing conditions for a year or two, failure to cover direct costs changes farming patterns much more quickly than failure to cover total costs. The 1966 U.S. crop was produced at an average direct cost of 20.6 cents per pound. Average direct costs varied by regions from 13.8 cents per pound to 30.2 cents. Over one-fourth of national production was grown at a direct cost of less than 15 cents per pound, and nearly one-half at less than 18 cents.

While costs and yields vary greatly in foreign countries, the cotton produced in each country or area tends to be relatively uniform in value. Generally, this means that farmers unable to maintain yields equal to the regional averages have found cotton unprofitable in recent years. In Mexico, for example, indications are that producers in most areas fail to cover total costs at 26 cents per pound on a yield of 600 pounds per acre. Yet that yield would give a reasonable profit to most farmers in the Tapachula and Juarez areas. At 23-24 cents a pound, a yield of 800 pounds would cover total costs on most farms in all areas of Mexico (national average yield normally falls between 625 and 675 lb.). A sizable part of Mexico's crop cost less than 20 cents per pound in direct expenses.

In Central America, production costs are believed to be somewhat lower than in Mexico. Irrigation, labor, and ginning costs are higher in Mexico, while pest-control cost is higher in Central America. Average total costs in Guatemala and Nicaragua are about 25 cents a pound on land yielding 600 pounds of lint per acre. El Salvadoran costs average below 22 cents per pound at a 600-pound yield. At a yield of 800 pounds, average per pound costs in Nicaragua, Guatemala, and El Salvador are about 22.6, 20.9, and 20.1 cents, respectively. With an 800-pound yield, direct costs in Central America center around 15 cents per pound, with Nicaragua higher.

In Colombia, climatic conditions make high yields relatively difficult to achieve, and insect control is a large cost item. Minimum purchase prices for major producing regions are fixed each season at a level designed to cover average total costs at average yields. Nevertheless, producers who are able to get higher than average yields find cotton attractive. In Brazil, the cotton situations in the two major cotton producing regions are radically different from each other. The Northeast grows much of its cotton under a subsistence system not closely related to world conditions. The South, on the other hand, where three-fourths of the crop is grown, has favorable conditions for extremely low-cost operations. Irrigation is not practiced; and compared with those in most other major producing countries, costs are low for such inputs as pest control, fertilizer, labor, and land. Cotton is generally profitable despite the relatively low yields obtained and the low prices received in world markets.

Where favorable yields can be obtained, cotton can be grown in Iran and Pakistan at relatively low cost and is generally quite profitable. Much of Iran's cotton is shipped under bilateral agreements to Communist countries. Pakistani cotton commands a relatively high price in import markets, because of its high strength; and shipments of cotton to Western Europe have increased in recent years. Low production costs coupled with expanded irrigation facilities have been conducive to larger production. No specific information is available on production expenses in Syria, but total costs are believed to be similar to the Turkish level of 18-22 cents per pound. Much of Syria's cotton is destined for Communist countries. Average costs in Greece are relatively high, and cotton would be unprofitable

Raw cotton: Estimated production costs in specified countries at average and above average yields, 1970-71¹

Item	Unit	Mexico	Guatemala	El Salvador	Nicaragua	Colombia
Lint cotton per acre	Pounds	600	800	600	800	491
Price received per pound	Cents	26.0	26.0	26.2	25.0	24.0
Income per acre ²	Dollars	156	208	156	210	118
Adjusted total cost per acre ³	Dollars	164	179	149	158	168
Adjusted direct cost per acre	Dollars	142	155	104	117	119
Net return per acre:						1.27
Over total cost	Dollars	-8	29	7	41	94
Over direct cost	Dollars	14	53	52	50	41
Adjusted total cost per pound	Cents	27.3	22.4	24.8	20.9	74
Adjusted direct cost per pound	Cents	23.7	19.4	17.3	14.6	18.1
		South Brazil	Turkey	Greece	Iran	Pakistan
Lint cotton per acre	Pounds	365	462	652	800	380
Price received per pound	Cents	20.4	20.4	24.5	24.5	28.5
Income per acre ²	Dollars	74	94	160	196	12.8
Adjusted total cost per acre ³	Dollars	60	75	144	144	105
Adjusted direct cost per acre	Dollars	45	58	110	111	132
Net return per acre:						1.25
Over total cost	Dollars	14	19	16	52	77
Over direct cost	Dollars	29	36	50	85	42
Adjusted total cost per pound	Cents	16.4	16.2	22.1	18.0	23.2
Adjusted direct cost per pound	Cents	12.3	12.6	16.9	13.9	13.3

¹ Converted at rates of exchange in effect at the beginning of 1971.

² Includes government payment of \$55.
³ Unginned.

⁴ Includes government payment of \$47.

⁵ Less value of the seed.

on much of the acreage if the Greek subsidy (about 5.8 cents per lb. of lint) were eliminated. Production costs in the USSR are believed to be far above U.S. levels, but no specific information is available. However, production costs appear to play at most a secondary role to political considerations in determining both production levels and offering prices in Western cotton markets.

Production costs are important, but it must be reemphasized that many factors must be considered before a specific crop is selected for a specific field. Also, all countries have many efficient farmers able to produce cotton far below the national average. Net return per unit of land compared with that for other crops is of vital importance in determining the farm pattern.

So, also, is the relative risk incurred by alternative farming patterns. In subsistence farming economies, the self-interest of the farmer in producing enough food to be self-supporting is an important factor in deciding how much land and labor will be devoted to a cash crop such as cotton.

Costs between farm and mill.¹—In terms of costs, U.S. cotton faces some of its strongest competition after it leaves the farm. It costs more than \$60 to move a bale of U.S. cotton from the farm, through the gin, to the foreign mill. If U.S. cotton is to aggressively regain world markets, ginning and other marketing costs must be reduced. Efforts to produce cotton cheaply can be nullified by inefficiencies or unnecessary operations that occur between the farm and the customer in import markets.

The average charge for ginning and wrapping a bale of cotton was \$19.15 in 1969 in the United States, with variation by State from just over \$14.00 in Georgia to over \$22.00 in California. Information from competing countries show a spread in ginning charges from about \$7.50 in Greece, Iran, and Colombia, to \$16.00 in Mexico. Charges in Brazil, Central America, and East Africa fall between \$12 and \$14. Charges in Turkey approximate \$10 per bale.

A number of factors account for the higher U.S. ginning charge. Labor requirements in terms of man-hours to operate the gin and attendant functions tend to be slightly higher in most foreign countries using saw gins than in the United States. Man-hour requirements are even higher where roller gins are used. Even so, wage rates are so much lower elsewhere that labor expense per bale is substantially higher in the United States. A more critical point, however, is volume of cotton handled per gin.

In 1969, the average U.S. gin handled about 2,500 bales during a 6-week period when the gin operated about ninety 8-hour shifts. The typical saw gin in competing countries handles 10,000 to 12,000 bales over a ginning period of several months. The U.S. system of ginning each lot of seed cotton as soon as possible requires far more plant capacity than is needed in foreign nations where seed cotton may be held on the gin yard weeks or months before processing. Therefore, fixed cost per bale also is far higher in the United States. U.S. Department of Agriculture studies² suggest that the U.S. cotton industry could reduce ginning costs substantially if gins with inadequate volume were consolidated or if a practical method of central ginning could be applied to U.S. conditions. It is possible that the shift on July 1, 1971, to net weight trading for U.S. cotton will encourage use of lighter, less expensive tare, similar to the light-weight bagging and wire ties in common use in many foreign countries.

A great majority of the U.S. cotton crop is pressed in bales of low density at the gin. Bales destined for export are pressed later to high density in order to qualify for lower ocean freight rates at a commercial compress. In most competing countries, cotton is pressed at the gin into bales of medium density or high density. In the United States, the change to high density gin pressing—in conjunction with other changes—could reduce recompression, freight, and other costs by approximately \$5 per bale.

Though ginning and pressing costs—accounting as they do for well over one-third of total marketing costs—offer the greatest opportunity for cost reduction, efficiencies are possible at other points along the marketing line. Foreign cotton typically changes hands fewer times than U.S. cotton. Frequently, the farmer sells his crop to the ginner, who is also the exporter. Other farmers sell baled cotton directly to the exporter. In El Salvador, a semigovernmental cooperative gins and markets the entire crop for its farmer-members. In Colombia, a number of farmer organizations handle marketing for members, but all ginning is done by a government ginning organization.

¹This section draws upon information developed for the United States by the Farmer Cooperative Service of USDA, and upon a study conducted at Texas Technological University with funds supplied by the Cotton Producers Institute. The latter work is reported in a publication entitled *An Industrial Engineering Study of the Operations Through Which Cotton Passes Between Farm and Mill*, by William D. Sandel, Milton L. Smith, and Mark L. Fowler.

²See Farmer Cooperative Service, Research Report No. 9, "Reducing Cooperative Cotton Ginning Costs in Oklahoma", by John D. Campbell, January 1970.

Assuming efficient operations, fewer transactions should enable cotton to move through marketing channels at lower costs, because some of the per bale expenses and profit of the eliminated middlemen would be unnecessary—especially if merchant volume could be increased to more efficiently handle the crop. Streamlined marketing operations could lessen the need for extensive reassembly of individual bales into even running lots.

Subsidies on production and/or exports.—Many countries grant inducements designed to encourage increased cotton production. These aids may be direct (as in the form of a specified payment per acre) or indirect (such as favorable tax treatment). Examples of aid cited in this report make no pretense of being all inclusive. Many other cotton producing countries encourage production and exports through similar methods.

It should be noted that foreign governments almost always institute aids specifically designed to increase cotton production, whereas in the United States, the main thrust of cotton legislation over the years has been aimed at maintaining farm income on limited acreage. Where appropriate, subsidies on cost input reduce expenses in estimates of production costs.

In Brazil, the Government sets minimum purchase prices, generally at a level below the market price. Short-term loans without carrying charges are available for purchase of fertilizer. Exports of production in excess of Colombia's domestic requirements earn government certificates equal to 15 percent of the export value of the sale. The certificates can be used to pay taxes. In El Salvador, the Government makes available low-cost credit to cotton producers through the cooperative. To our knowledge, other Central American countries receive no direct subsidies on cotton production. In Mexico, most aid is directed toward helping small producers through cotton purchase and loan operations of the Banco Nacional de Credito Ejidal. Some cotton leaders believe that the Mexican Government soon will make cotton more attractive relative to alternative crops through elimination or reduction of various taxes and charges levied on cotton and through expansion of crop insurance and credit facilities.

Pakistani cotton production is encouraged by the Government through low irrigation water rates and increasing availability of attractive credit. In addition the Government absorbs 75 percent of the cost of pesticides, 35 percent of the fertilizer costs, and a portion of the cost of improved seed. Exports of raw cotton and textiles earn bonus certificates equal to 10 and 45 percent respectively of the export value of the shipment. The Iranian Government encourages production expansion through rebates on input costs. Producers receive funds equal to one-third of fertilizer cost, 3 percent of the interest on production loans, and all of the aerial spraying expenses, provided technical assistance instructions from the Ministry of Agriculture have been followed.

In Turkey, any losses incurred on price support activities of cotton cooperatives are absorbed by the Government. Attractive credit facilities are provided by the Government Agricultural Bank. Exports are encouraged by the Commercial Bank through credit to foreign buyers for up to 90 percent of the f.o.b. value of the cotton shipped. In Greece, producers receive a payment of about 5.8 U.S. cents per pound of lint cotton. Farmers are entitled to a repayment of 25-30 percent of the value of certain farm machinery purchased and 4.5-4.9 cents per pound of improved planting seed. Exporters may obtain credit from government facilities and are eligible for a tax deduction equal to 2 percent of gross income.

Cotton prices are fixed each season by the Cotton Board in Uganda. While these guaranteed prices are supposedly related to world price levels, the Board suffered substantial losses in some past years and built up reserves in others. Planting seed is supplied free, and insecticides—though not used in large quantities—are heavily subsidized. Tractor plowing of land is available at about one-half of actual cost, but the service is used by relatively few farmers. In Tanzania, fixed producer prices and other Board operations may result in a loss in a given season. The Lint and Seed Marketing Board supplies planting seed free. Credit for production needs is available from the National Cooperative Bank. Cotton Boards in both Uganda and Tanzania provide many services (such as road construction) that are built with tax money in the United States.

The U.S. concept of subsidies has little meaning when applied to farming systems on collective and state farms in the USSR. All USSR cotton is delivered to government gins. The value of the seed cotton is determined by the quality as related to a fixed price for the base grade. The state or collective farm is then credited with the aggregate value of the cotton. The transaction price for the base grade of upland cotton in 1970 was about 24.7 U.S. cents per pound for seed cotton (72.7 cents per lb. of lint), converted at the official exchange rate. However, this internal procurement price has little relationship to the utility value of the cotton produced, or to the generally competitive offering prices for USSR cotton in Free World markets.

Alternative crops.—Cotton is generally grown within a farming pattern established over time in each country. Land capability, the availability of required production and market facilities, tradition, government policy, production costs and returns, and many other factors determine the makeup of farm enterprises. Changing relationships among these factors influence changes in the farming pattern from one season to the next. For example, the introduction of high-yielding wheat varieties was largely responsible for the marked reduction in Turkish cotton acreage in 1969 and 1970. However, wheat yields this season were disappointing, and higher cotton prices likely will encourage a shift of acreage back to cotton in 1971-72.

Declining profits from cotton over the past few years prompted Mexican farmers to search for alternative crops to fit into the established cotton-wheat crop system. In the Northeast, feedgrains proved to be an acceptable alternative, while soybeans, as a single crop or as a second crop following wheat, absorbed considerable acreage formerly planted to cotton on the West Coast. Again, favorable cotton prices this season will encourage increased cotton planting in 1971-72.

In Central America, major alternatives to cotton production are few, other than pasture (both improved and unimproved) and corn; and a great expansion of corn acreage would be likely to lower prices and could conceivably undermine the economy of interior villages largely dependent upon corn. Where soils are suitable, considerable acreage in South Brazil shifts rather easily among cotton, peanuts, corn, and a few other crops when profit relationships change. Soybeans, frequently sown after wheat, are emerging as a competitive crop. Acreage shifts between cotton and coffee are dictated by unusual weather conditions, coffee policy, or profit potential.

Crops alternative to cotton in the interior region of Colombia include sugarcane, rice, and corn, while ranching is the only major alternative to cotton in the Coastal region. Wheat, largely for family needs, is the dominant competing crop in cotton areas in Iran and Pakistan. Sugarcane and oilseeds account for considerable acreage in some cotton areas of both countries.

From a profit standpoint, cotton has no close competitor on irrigated land in Syria, except relatively small acreages of fruit and vegetables. In East Africa, cotton does not compete for the acreage used to grow family food crops but commands only enough of the remaining crop land to provide a modest income. In the USSR, cotton is grown on a one-crop basis in most producing areas. Acreage shifts follow official planning decisions.

COMPETITION IN IMPORT MARKETS

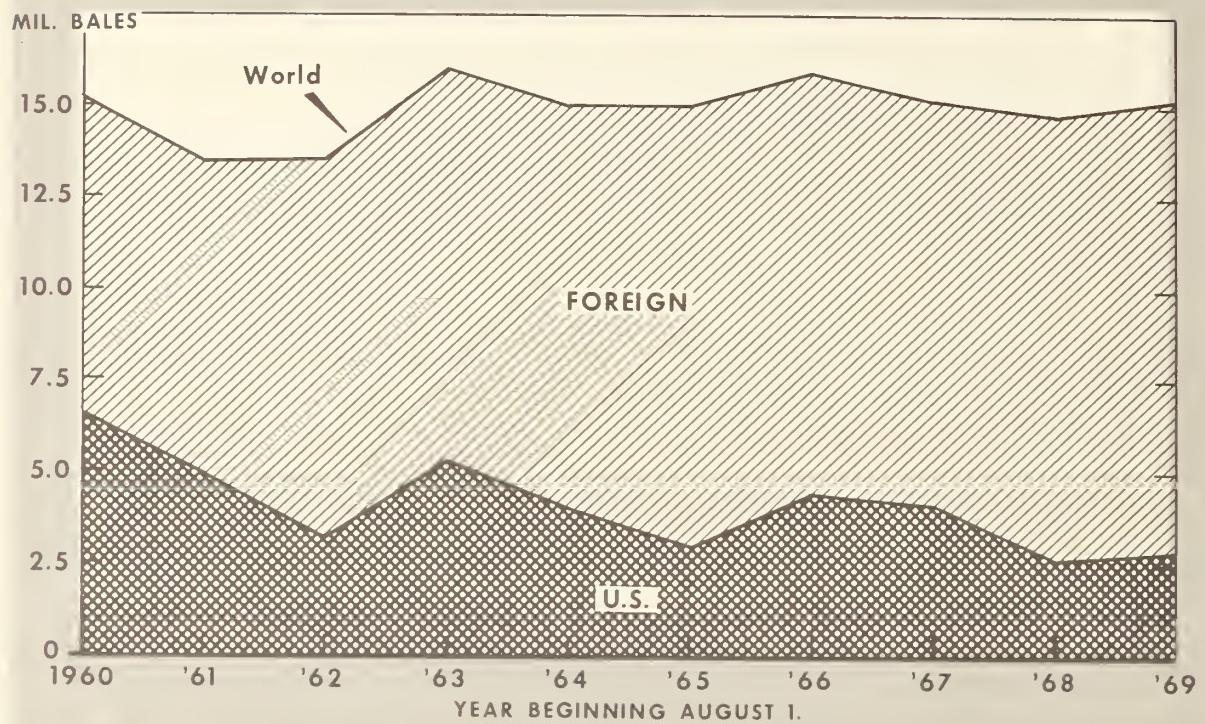
Competing growths of cotton.—All cotton-exporting countries share in the desire for cotton markets in importing nations, and many nations compete vigorously for a larger share of those markets. For many years, most foreign producers have succeeded in increasing exports while the U.S. share of the market has declined. Foreign exports of upland cotton doubled during the past 15 years, while U.S. shipments declined substantially. A number of complex interrelated factors are important to an understanding of the decline in U.S. exports during the past several years.

While price is critical in negotiations for a specific sale, and of major importance in determining future supplies, its role is strongly influenced in import markets by other factors. At a given point in time, the world supply of cotton in the months ahead is fairly well known. Generally, realistic estimates of U.S. cotton prices can be made for from 6 months to 18 months ahead. When U.S. supplies are generous, this forecast acts as a price ceiling. Traditionally, foreign producing countries have chosen to finish selling exportable supplies soon after harvest rather than incur carrying charges. When foreign supplies are large, prices of foreign cotton may fall well below the U.S. level. Such price differences sometimes have continued for rather long periods.

Even when U.S. and foreign prices appear to be competitive, some sellers offering several growths may tend to give preference to foreign cottons. Sometimes this may be because the operating margin is wider on foreign growths and sometimes such sellers may have a financial interest in ginning or other marketing operations within the foreign country.

Many foreign mill buyers feel that superior foreign cotton can be purchased at the same price quoted for comparable qualities of U.S. cotton. The opinion is often expressed that U.S. harvesting and ginning methods lower the spinning performance of U.S. fiber. Also, U.S. cotton is reported to have a lesser degree of fiber uniformity within individual bales and within lots of bales than is found in foreign cotton. For several decades, widespread criticism has been leveled at the appearance of the U.S. cotton bale package, and it is claimed that the ragged condition of the bale cover contributes to excessive waste in the mill opening room. This problem, whether real or imaginary, can have a definite psychological influence on the spinner's choice of growths. More importantly, the

WORLD EXPORTS OF UPLAND COTTON



spinner makes his choice after shopping the world market, and bases it on the best quality he can get for the price. When and if the supplier, in order to meet the price competition, sacrifices on quality the spinner may be faced with the necessity of seeking an adjustment either voluntarily or by arbitration. Foremost in the spinner's mind is the question of where he can get adequate supplies at the cheapest possible price that will meet his quality needs, give the least amount of trouble in the mill, and maintain maximum production.

The spreading use of trade agreements to encourage trade between cotton-producing and cotton-importing countries is a factor that adversely affects U.S. cotton exports. On a multinational scale, operation of the Latin American Free Trade Association effectively eliminated significant U.S. cotton exports to members of that organization. Even so, most of the large cotton import markets which were traditionally supplied by the United States are still basically free markets.

One must remember, too, that U.S. spinners cannot shop the world markets as the importing countries can. U.S. mills must purchase from the U.S. crop the qualities needed or simply not get the cotton. Therefore, U.S. mill buyers search aggressively for desired cotton as the crop is being marketed. Generally, foreign buyers delay commitments to purchase cotton until nearer the time when it is needed in the mill. This has to some degree the effect of limiting selection of cotton from the U.S. crop for consideration by most foreign buyers. In many foreign producing countries, domestic requirements represent a much smaller portion of total production than in the United States. Furthermore, some countries require cotton exported to meet certain quality standards and identification.

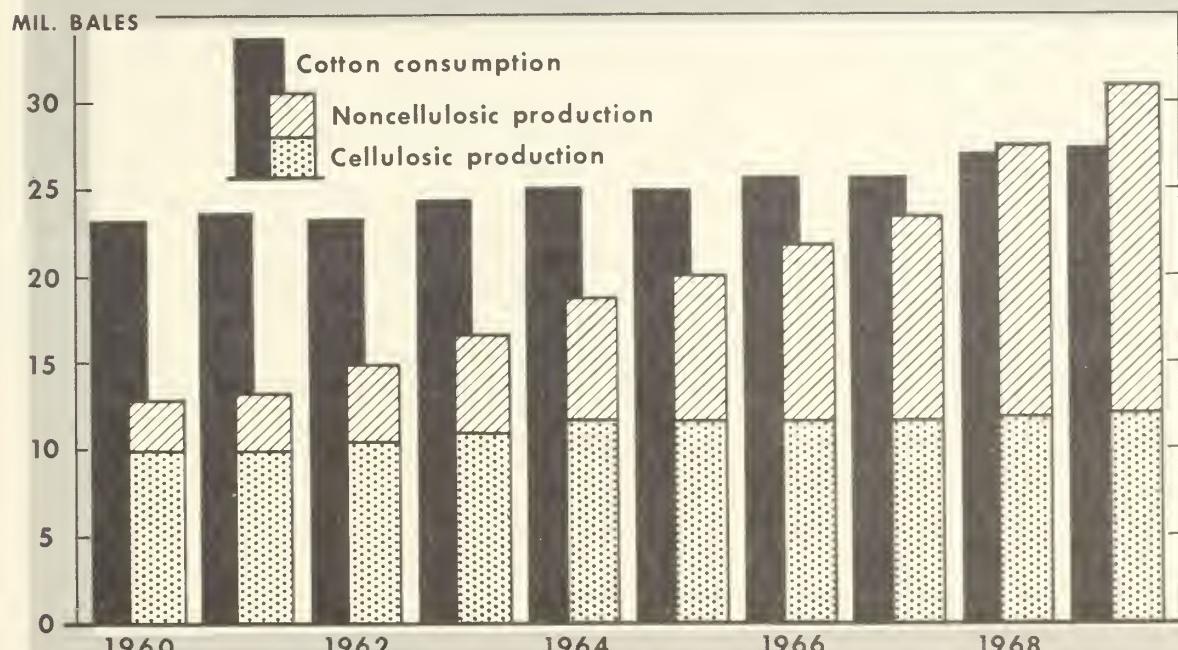
The validity of some of the criticism of U.S. cotton's quality is open to considerable doubt, but the fact remains that much of the criticism is believed by many potential purchasers of U.S. cotton. If U.S. exports are to be maximized, every effort must be made to improve the image of U.S. cotton.

Flexibility is essential in maintaining consistently competitive prices, both during periods when supplies of cotton are large and when supplies are relatively tight. Increased use of technical assistance could help many mills use U.S. cotton more efficiently. Technical services are provided by some other cotton exporting countries and by manufacturers of manmade fibers. Marketing practices should be reviewed to find ways of improving existing methods. The shift on July 1, 1971, to net weight trading within the United States could encourage lower freight

cost through lighter tare and a more attractive package using different packaging material, and possibly also through wider adoption of mechanical sampling. Many foreign buyers have expressed a desire to purchase cotton identified as to specific variety and area of production in an effort to obtain more uniform lots. Every effort should be made to encourage U.S. shippers to ship uniform lots of cotton. If adaptable to U.S. conditions, seed cotton marketing and/or large volume operations—perhaps over an extended ginning season—could make it easier to assemble even-running lots and large blocks of cotton at lower prices. Maximum flexibility in the system of premiums and discounts could alleviate the problem caused when certain qualities flow in large volume into the government loan, thereby reducing export possibilities. Finally, and of paramount importance, it must be remembered that continued exports of U.S. cotton depend on an available supply of cotton of desired qualities at competitive prices.

Manmade fibers.—The textile market in the foreign Free World expanded substantially in the decade of the 1960's in the wake of rising population and improved living standards. However, most of the growth was absorbed by manmade fibers,¹ use of which increased annually by an average of 1.8 million bales² in cotton equivalent or 24 percent, while use of cotton rose 400,000 bales or 1.6 percent annually. Trends were strikingly different for various groups of manmade fibers. While use of cellulosics increased an average of 2 percent per year, that of noncellulosics jumped an average of 68 percent. Understanding the reasons behind the divergent trends among the manmade fiber groups is important to understanding how cotton interests can best act in their own behalf.

COTTON CONSUMPTION AND MAN-MADE FIBER PRODUCTION IN FOREIGN FREE WORLD



¹In this report, manmade fibers are classified as cellulosic fibers (principally rayon and acetate) and noncellulosic fibers (mainly nylon, polyester, acrylic, and textile glass).

²In equivalent bales of cotton.

Rayon fiber—the oldest commercially important manmade fiber—is now regarded as relatively interchangeable with cotton in a wide range of end uses when the major consideration is to hold cost down. For many years, cellulosic consumption has increased substantially during periods of “high” cotton prices while expansion was stalled in periods of “low” cotton prices. In the last few years, production of rayon and acetate has leveled off in the non-Communist world; and in some years and in some countries, consumption of these fibers has substantially declined.

Higher quality rayons have been developed in recent years, but present prices do not offer much opportunity for profit. It seems clear that cotton’s key weapon in the battle against cellulosic manmade fiber is maintenance of an adequate supply of cotton in a broad range of qualities at competitive prices. Current cotton prices may restrict cotton consumption and lend added impetus to further inroads by manmade fibers into cotton markets.

Competitive aspects between cotton and noncellulosic fibers and between noncellulosic and cellulosic fibers are complex. While prices of the various fibers are important, other factors sometimes overshadow price. Noncellulosics have gained an advantage in this era of easy-care finishes, since researchers have not yet developed an entirely satisfactory finish for 100-percent cotton goods. Cotton is needed in most end uses to hold chemical finishes and for comfort and its other characteristics, so blends of two or more fibers have become common in the textile industry. Manufacturers of noncellulosic fibers push textile spinners toward the highest feasible ratio of noncellulosic to cotton fiber through use of sales contracts that spell out blend ratios, advertising allowances, market research activities, promotion to create consumer demand for their products, and technical assistance. Spinners often express a preference for manmade fibers because of the frequently wider margins and continuity of quality-controlled supplies of raw material from few suppliers. In certain European nations, large manmade fiber producers own substantial textile capacity formerly devoted mainly to cotton processing.

It is evident that cotton interests must intensify their efforts if cotton is to retain or improve its present position in the textile markets of the foreign Free World. In recent years, much effort has been centered on improving permanent press treatments for cotton. Technical assistance is needed to keep mill users abreast of changing techniques so that they can use cotton more effectively. Both generic and brand-name promotion should be intensified to help offset the huge expenditures by manmade fiber interests. It is difficult to regain markets lost to manmades, but promotion can minimize further inroads. Promotion contributed heavily to increased cotton use in the mens’ shirt market in Sweden and the United Kingdom, according to the International Institute for Cotton.

Research to determine the best blend levels for the consumer are being undertaken in an effort to increase cotton consumption through higher cotton ratios in the blend. Domestic cotton interests have shown a willingness to promote blends with a high percentage of cotton on a trial basis, if such products are found to have wide consumer acceptability. Finally, every effort must be made to provide desirable qualities of cotton at prices that will encourage use of cotton in more favorable cotton—manmade blends, and where practical, in 100-percent cotton products.

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